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100: 66580d Improvement of growth yield of yeast on glucose to the maximum by using an additional energy source. Babel, Wolfgang; Mueller, Roland H.; Markuske, Klaus D. (Inst. Tech. Chem., DAW, DDR-7050 Leipzig, Ger. Dem. Rep.). *Arch. Microbiol.* 1983, 136(3), 203-8 (Eng). The exptly. detd. growth yield on glucose [50-99-7] under aerobic condition is ~0.5 g/g, but on the basis of the C content a value of 0.71 g/g should be the upper limit if C conversion is improved by the use of an addnl. energy source. This assumption was investigated with the methylotrophic yeast *Hansenula polymorpha* MH 20. Formate [64-18-6] served as an addnl. energy source. The growth yield expts. were performed with a transient-state fermn. technique in which formate was fed via an increasing concn. gradient to a culture growing continuously on glucose. As a result the growth yield on glucose was improved. The extent was dependent on the formate feeding rate, i.e., the slope of this formate gradient. The predicted max. growth yield of 0.7 g/g was obtained at a slope of the formate gradient of 0.21 g/L-h at a glucose concn. of ~1 g/L. Steeper gradients did not further improve this value, but rather impaired the growth yield due to the appearance of a high residual formate concn. in the fermn. medium. The yield patterns are influenced by the culture pH; a value of ≥ 4.8 is necessary to achieve the max. growth yield on glucose. At lower pH formate became increasingly toxic. The ratio of formate to glucose necessary to obtain the max. yield coeff. was necessary to obtain the max. yield coeff. was 1-1.6:1 (in grams). On the basis of the energy content of formate a ratio of 1.2-1 (P/O = 2) was calcd. to substitute the part of glucose which is endoxidized for energy generation. Deviations from this value are explained in terms of the manner of uptake and uncoupling property of formic acid/formate and the existence of a second, formate-wasting enzyme.